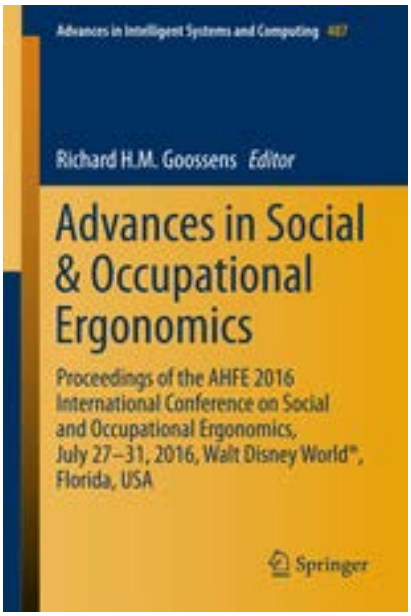

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Contents

A Future Framework of Knowledge-Based Ergonomics Assessment System at Workplace in Automotive Assembly Plant

Fazilah Abdul Aziz, Zakri Ghazalli, Nik Mohd Zuki Nik Mohamed and Amri Isfar

Abstract There are several parameters must be correctly evaluated to guarantee a good level of interaction between worker and working system, in order to avoid safety and health problems. The lack of attention to occupational ergonomics issues may to potential ergonomics risk for which decision makers are ignore when develop new product and process. This paper proposed a novel framework to facilitate the ergonomics knowledge management for occupational risk assessment. It serves two objectives, the first objective is to aid the decision makers predicting ergonomics risk element at early stage of development product and process. The second objective is to develop knowledge-based ergonomics assessment system (KBEAS) in automotive assembly plant. The respondents of the study are about 250 and consist of assembly workers ranging from operator to executive level in automotive component assembly plant. The activities of direct observation, activity analysis, photography, video, survey questionnaire and interviews, are employed to measure the occupational ergonomics risk factors. The outcome of these activities will be used as an input for analytical hierarchy process (AHP) technique to prioritize the occupational ergonomics risk ate workplace. The outcome of this framework could ease decision makers in assessing and prioritizing the ergonomics risk at the early stage of product and process in automotive component manufacturer.

F.A. Aziz (✉) · Z. Ghazalli · N.M.Z.N. Mohamed
Faculty of Mechanical Engineering, University Malaysia Pahang, 26600 Pekan, Pahang, Malaysia
e-mail: Fazilahaa@ump.edu.my

Z. Ghazalli
e-mail: zakri@ump.edu.my

N.M.Z.N. Mohamed
e-mail: nikzuki@ump.edu.my

A. Isfar
Ingress Technologies Sdn Bhd, 48300 Rawang, Selangor, Malaysia

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2 Intelligence Decision Support System Applies in Ergonomics Assessment Process

2.1 Theoretical Approach

Employees in assembly plant must have a comprehensive understanding of the scope of the discipline and be able to apply the ergonomics principles to improve working conditions. In 2000 the International ergonomics association (IEA) has proposed the three broad domains of specialization within ergonomics in order to establish some clear identification of the recognized areas of the discipline [15]. The three broad domains of specialization can be referring to Table 1. Generally, work-related strain (both physical and mental) is being reported more often, and this tends to lead to such things as increased absenteeism, poor motivation or commitment to the job [16]. As shown in Fig. 1 there are five basic elements of occupational ergonomics that need to be addressed in workplace. When analyzing

Table 1 Domain of specialization within ergonomics, by international ergonomics association, 2000

Physical ergonomics	Cognitive ergonomics	Organisational ergonomics
Concerned with human anatomical, anthropometric, physiological and biomechanical characteristics as they relate to physical activity	Concerned with mental processes, such as perception, memory, reasoning and motor response, as they affect interactions among humans and other elements of a system	Concerned with the optimisation of sociotechnical systems, including their organisational structures, policies and processes

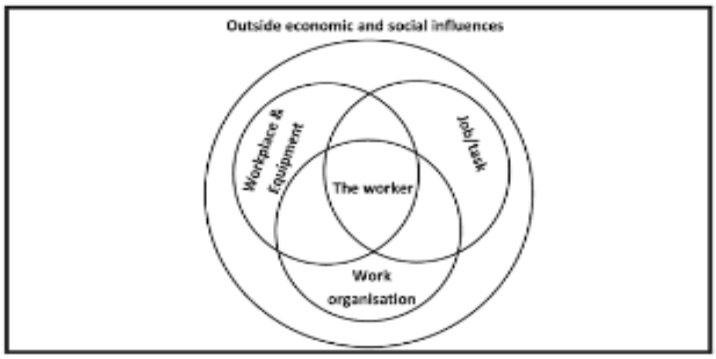

Fig. 1 The relationship between different elements of occupational ergonomics

assembly work and how it can be improved from an ergonomics point of view we need to consider the human element of the workplace, job requirements, work stations and equipment design, working environment, and work organization structure. How these elements interact and allow for a good match between workers and their works is one of the aims of occupational ergonomics assessment in this research study.

2.2 Conceptual Framework

The useful knowledge or data needed for the ergonomics assessment and risk level analysis systems is stored in the knowledge base. The procedures for knowledge acquisition and knowledge management are illustrated in Fig. 2. The framework consists of an industrial assessment and process experience. The knowledge obtained from these sources will be structure so that it can be used by an inference system and can contribute to the solution of a broad range of problems.

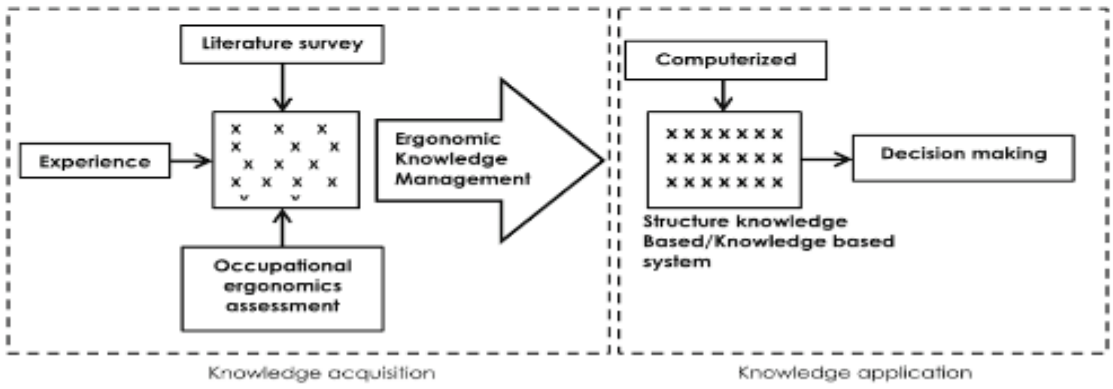

Fig. 2 The conceptual framework of the study